

Custom Schools with a Class size of 1 or 4
Brewster Kahle
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This last September, our 13-year-old boy, Logan, rather than return to his San Francisco private school began taking lessons in a custom school his mother and I created around him. I don't use the word "homeschooling" because that may conjure images of workbooks on the kitchen table with a parent being the major teacher. Logan, in contrast, is being taught one-on-one English and history by a former school teacher, learning Chinese language and culture from a young Taiwanese woman who has tutored before, Geometry from me three hours a week, in addition to a birding class taught mostly to adults, and a science class for homeschoolers at our local science museum, the Exploratorium.

I don't know what to call this educational environment, but "homeschool" does not seem to describe it. In talking with other parents, we have found that this type of free-form schooling is not uncommon: one parent called himself a "general manager of education" as he explained that he did not teach so much as arrange, and in their case they leveraged the local community and junior colleges with one of their children taking their first college class at age 11. Whatever this school is, Logan is fully engaged, our family is closer than ever, and I am starting to think we are onto something. To put a name on Logan's new school, I will call it a "custom school."

While we just started this program with Logan, we are encouraged to continue and explore how schooling might be reorganized for some classes of students. This has gotten me thinking about how far this could spread and possibly leveraging the charter school system to build a new type of public school, one that has a class size of 4, but that is getting ahead of myself. Please allow me to explain how I have gotten here.

Nervous

His mother and I were nervous about taking him out of school since we, of course, want the best for our child, and who are we to say we know a better way than the systems that most families accept? Even though Logan was getting A's at the two private schools he had attended, he still did not make friends nor was he challenged academically. His obsession in birding was a subject of ridicule at his recent school, and he begged to be homeschooled. For him, it was a way to make his own schedule around a rigorous schedule of birding, and he pointed out that many other attendees of summer birder camp were home schooled. For us it was something else, something about learning more and staying engaged, but frankly we were not sure what we were trying to do for him. People told us of the value of socialization in traditional schools over homeschools, but we were not convinced that learning to navigate a school of 13 year old boys would be as valuable towards learning social skills as the more diverse set of social situations we imagined he might encounter in

a custom school environment. It took us a couple of years of discussion, and finally it was listening to our son that convinced us to try.

We called his school, paid the financial penalties, and we were out.

Now we had to learn fast since the first day of school for our 16-year-old son was three weeks off so we reached out for help. Two different friends had hired teachers and set up a custom school for their three children and they encouraged us based on their experience. Another friend was doing the teaching herself and she recommended a California Homeschoolers Conference that was coming up in a week in Sacramento. (<http://www.hscconference.com/>)

When our family arrived at the conference hotel, there were kids running around and parents reuniting as we walked to the reception desk. Welcomed by parent volunteers, they told us of the talks and gatherings for the parents and the kid-directed activities for the kids. We were relieved to not find a heavy Christian theme that we had heard was common in homeschooling.

We learned about how to leverage the community colleges and junior colleges, and how to get over the anxiety of being a new homeschooled family. We learned of the different styles of homeschooling from structured class times to “unschoolers.” But best of all, everyone was happy to share and their eyes sparkled. There seemed to be no guru or leader, just those with a common idea that was working for their families. Many had started in the school system and pulled out because the parents felt that their children were not being well served by traditional schools, while others knew they wanted to homeschool from the start.

Reassuringly, the kids around us were interesting, polite, and engaged. We brought our reluctant 16-year-old to the conference as well, and he made new friends quickly. He said that he was thought of as an interesting addition because he liked going to school, real school, and this was seen by the other teens at the conference as bringing a good alternative perspective. This comment made me pause and appreciate this group of people. Here we were, in a gathering of people, all of whom were looking for help and support in a common activity that much of society sees as alien, strange, or possibly illegal. Our 16-year-old son, who defined himself early on as not belonging to this group, was still welcomed into the fold of other teenagers who searched for identity. If this is how my kids might turn out by homeschooling—accepting and curious—then I was all for it.

At the conference, one popular subject was selecting educational materials. Some families used workbooks, but most used primary materials and Internet sites. The Internet Archive’s collections were mentioned as well as video lectures like the Khan Academy. (<http://www.khanacademy.org>) The Khan Academy started as a project of a single person to teach his far-away nieces math using YouTube. Others watched the videos and encouraged this project. This method of teaching math

caught on with families, and the Khan Academy now has over 2,000 lectures that have been watched over 34 million times. Interestingly, the Gates Foundation recently gave the Khan Academy founder a grant for two million dollars to support this work. As the Internet Archive has been working on “open educational resources” for some years, it is helpful to see it on the user’s side. There are still many holes in what is available, but there is momentum and the homeschool community seems to be a leader in this area since it is not bound to the state-certified textbook system.

Another issue addressed in the conference was the legal situation in California for homeschoolers. We heard that it has gotten easier over the years with 2 main choices emerging—one was to declare one’s household a private school and follow a few rules like taking attendance and “offering” classes that need not be “chosen”. The other option was to enroll in a charter school that caters to homeschoolers, where the child is enrolled and the parents get about \$800 for texts books and other educational materials as well as access to facilities and educational counseling.

The charter school system seemed unfair to me since the school receives maybe eight thousand dollars of public money and provides so few services to the students, that we decided on the private school option. We liked that there are no testing requirements and that a child can be declared graduated at any time the parents choose. For many parents, picking to graduate one’s child seems to hinge on getting improved access to higher education from the public community, state, and UC systems which are becoming more difficult to get in to given the repeated budget cuts.

But at this conference, we did not hear much discussion of employing teachers for their children, as we were intending to do. We reached out to the two of the people I know have basically built schools around their children and they told us some tips. One said she advertised on craigslist for teachers with a fun ad offering \$25 to \$40 per hour. She interviewed and then gave each teacher a three-month trial run.

With a bit of research, we found the average public school teacher salary in the United States to be almost \$51k/year but in California, the nation’s highest, to be almost \$64k.

(http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb09-ff14.html) While we were not offering the same benefits, but we felt offering \$30-\$35 per hour would not be out of line if they could work 5 hours or more a week.

Encouraged by the other parents and kids we met we were off to build our homeschool.

Our Custom School

As we started recruiting teachers, our ads got better, but the best responses came from one my wife, Mary, posted for an English teacher:

Are you....

Frequently fabulous
fervently funny
familiar with frumious
Franklin and Fry's
friendly
forgiving
forever forgiving
fond of the fjords
and....
and....
and.... (writer's block)
and can work in the fog?

If so - this may be the job for you!

... We don't require that he be nailed to a desk and actually would encourage interactive field trips and activities that make lessons enjoyable for all. ... We are looking for someone who can come 5-7 hours a week (but could be much more).

From this we got over one hundred responses including half a dozen written as poems and two or three who just wanted to say how much they enjoyed the ad. There were 5 people my wife wanted to have teach Logan, but we went with the applicant that turned out to be the teacher that Logan would have had in his previous private school had she not been laid off because of some health issue. Recruiting a great Chinese teacher was easy, and I wanted to try my hand at teaching math.

For science, we found many museums that offer special programs for home school children. We enrolled Logan in a 10-week hands-on science class at the Exploratorium, enrolled him in a full-day-a-week bird class with an expert birder at the Point Reyes Bird Observatory, and continued a three-hour-per-week internship at the California Academy of Sciences.

In three week's time we were ready to start. We decided to use a small room in the Internet Archive building for our classroom based on a tip that it helps kids focus to have a special place for schooling.

Still my doubts continued—were we doing the right thing by our child? To help me gauge progress in some quantified way, we had an SAT tutor administer the SAT at the beginning of the school year, with the thought of repeating it every 6 months or so. At least by having these scores, we have some data to fall back on, however faulty.

Because I would be teaching Logan math, I wanted to make good choices with my math materials. I was frustrated with the boring workbooks that he got in the schools he went to. Math seemed to be taught as rote skills like accounting but I see math as beautiful, expressive, and pure thought. I wanted to inspire Logan to see it the same way. Around the house, Logan had demonstrated an astonishing mathematical intuition, but he does not know how to think like a mathematician, at least, not yet. I took that as my job.

Somewhat selfishly, I picked geometry because of the Greek roots of geometry married our family's enjoyment of Greek myths and history as well as reading Homer. I wondered if we could learn it together by reading a translation of Euclid's Elements that was written at the Library of Alexandria in the 3rd century BC. It turns out the Internet Archive has many scanned versions of it (<http://www.archive.org/search.php?query=%22euclid%20elements%22%20OR%20%22elements%20of%20euclid%22>). But the best version for us was found on the Internet as an web-based book, first posted in 1996 with many annotations and corrections (often quoting mathematicians from the over the last two thousand years) by a professor at Clark University, David Joyce (<http://aleph0.clarku.edu/~djoyce/java/elements/elements.html>).

So Logan and I started to read a two thousand year old text on our computers and working through the definitions, common notions, five postulates, and then each of the propositions that built from these.

Teaching Logan math has been fascinating and invigorating.

Working one-on-one allows me to see what he understand and what he doesn't, when he has had a good night sleep and when he hasn't, and when we needed to do some other supporting math rather than stick to the book. In practice we would jump off into elementary problem solving, or into some basic algebra if I though it was needed because we did not have a fixed schedule or other children to accommodate. Further, I believe that having a class size of one has made it possible for me to teach in the first place. While I am not the best to judge, I believe this is working because Logan is learning so many things so quickly. He had learned many things in math classes through the years, but I kept finding holes. He missed some conceptual points in dividing and adding fractions, dealing with exponents, as well as learning scientific notation, but he has picked them up quickly when addressed.

As Logan and I have moved through Euclid's Elements together I found that I was learning with him, we were discovering it together. Of course I had more techniques to decipher the problems, and I shared them with him as we worked with the material. In a real way, we were learning together rather than being a classic teacher-student relationship. We found this engaging, and I think he learned by watching me struggle with problems.

I am coming to think that working one-on-one allows subject experts to teach without as much traditional training as teachers receive since one-on-one teachers do not need the management skills required to face dozens of children at one time and hundreds during a semester. Where I would not want to teach 25 or 30 kids at once, the idea of teaching one or maybe a few is attractive. This one-on-one or one-to-a-few method of instruction harkens back to apprentice systems or what I experienced with a thesis advisor in college—much more customized instruction that goes beyond augmenting textual learning to instruction on how to approach issues and approach life.

The result of my experience from teaching Logan is that I am learning about my son and connecting with him in a much deeper way than I ever have. Other home school parents have observed a strengthening of their relationships as well. Our family bond has never been stronger.

Another interesting outcome is that Logan stopped taking Ritalin. His second grade advisor had urged our trying this medication to help him focus in a classroom setting. We had taken him off of the drug during summers but returning to the classroom would lead to the antisocial behavior which then lead us to reinstate the prescription. We found that when Logan was with groups of adults he did not have the problematic behavior issues. With our new custom school, we have dropped the Ritalin completely with little negative consequence, and we feel relieved taking him off of a powerful drug.

His history and English teacher, Suzanne Scafuri, spent their time together teaching him how to read and write by reading books together, then discussing and writing about them. He now says his favorite books are Kingbird Highway, Lord of the Flies, and Animal Farm, the three books they read together. She said she could teach in a different way than in a classroom because she could see what he did not understand and he could ask questions at any time. She didn't lecture like she would have in a classroom, as it was a customized lesson every time. She is also working with him to write a book on the birds of the Presidio. By providing structure and attention she has lead him to understand and enjoy fiction and expand his expository writing.

Suzanne's perspective on Logan's learning was useful to us because she had taught boys his age in both public and private schools. She found he was able to absorb the material more quickly than boys in a classroom. She has speculated that he may be ready for college with one year earlier based on speeding his learning. Suzanne wrote an article in an online magazine on class sizes and her experiences with Logan that echoes some of the experiences I have found:

"With a class of 35 students and a 50-minute class time, a teacher can hope for about 15 full minutes of teaching. The rest of the time is answering questions, resolving discipline issues, and passing out papers. Not a lot of people believe this is true, but, trust me, it is.

...I've worked in private schools where class sizes have ranged from 8-17 students per class. In working with 8 students for 50 minutes, I would have about 40 minutes of full teaching time. With 17 students, I had about 35 minutes of teaching time....

Very effective teaching, in my opinion, is with one student. It makes sense: when tutoring, a student has my full attention, and questions from students and parents produce conversation and thorough explanations....

[Logan] likes being able to have real working relationships with his teachers, where he can ask any question and get a detailed answer."

<http://pacifica.patch.com/articles/controlling-your-childs-class-size>

His Chinese teacher, Ling Ming Hou, is a young woman that has tutored but has not taught in a classroom so she is using the workbook that he would have used in his private school and his previous year's Chinese teacher is evaluating his progress. He is moving faster than the class of boys through the workbook and we hope with more comprehension. But beyond that, his teacher is bringing him out to the movies with her friends, and once to her house to make a Chinese dinner. She explained, "To learn the Chinese culture, you have to learn rice and how to cook rice." This type of one-on-one mentoring and infusion into Chinese culture is what we were hoping for. We may send him to China this summer for six weeks to teach English and learn Chinese with a small group of American children. Again, this type of language learning might be more helpful than a classroom.

The birding class is with 14 other birders with an acclaimed birder, Rich Stallcup. They get together for six hours at the Point Reyes Bird Observatory each Wednesday and learn about identification, behavior, and habitat as they are out in the field. This is not a class with a grade, but Logan is learning how to not call out too much and other socialization skills. He is younger than the other classmates by decades, but he is now seen as a valuable member of the class. Having bird class outside is an asset, and he would not be able to take this class while in regular school because it the timing constraints.

The last academic class Logan has taken is from the Exploratorium, but I am less sure how much he is getting out of it. While he is exposed to how to make circuits,

look through microscopes and do other science lab work, he may not have the preparation to get much out of the hands-on classes. If we were to build around these, so that by the time he got to the class he had learned the theory, I believe he might get more out of it.

His time interning with the scientists at the California Academy of Sciences has lead Logan to want to become a professional scientist. That the Academy is open to having children integrate somewhat into a professional environment gives a depth of exposure that is proving transformative to Logan.

We have also watched educational films as a family and encouraged our friends to teach him informally. By going to fencing classes 9 hours a week and with private piano lessons, we feel he is getting most of the ingredients of a school education but spread over the whole day and from many directions. At this point, he is in "school mode" even when at home now, and he is loving it.

At the end of his first semester, we are all happy with our experience. The schedule flexibility is probably what Logan appreciates the most because he enjoys going birding at the break of dawn and then hustles back to the Internet Archive building for math class at 8:30. When we retested Logan with the SAT, his math score was about the same as the beginning but his English composition score made a positive 300 point jump. Whether this indicates much is debatable, but at least he is learning how to take standardized tests which may be important in applying to get back into traditional school. We are now more confident that we have made a good decision and are looking to add more teachers to his school day.

As I have talked with parents about our custom school, some have said they are interested in trying something similar or joining in. While I am not trying to draw too many conclusions from our limited experience, I reviewed our financials and projected them for others.

Financials of our Custom School

For the semester that Logan was in school he averaged about 25 hours of academic instruction a week (most of it one-on-one, but some were some science classes with experts). Assuming I had been paid what we pay our other one-on-one teachers, the cost average comes to about \$24 per hour. If we compare that with the private school he was in, then was 22 instruction hours per week at almost \$35 per hour. (see appendix)

So not even accounting for classroom time having reduced instruction time to settle the class down, we got 13% more time for 25% less cost than a private school. This struck me as strange that custom teaching or, when in a group, learning from a subject expert should cost less not more than what we paid before. This custom approach seems much more valuable and yet it is less expensive.

But if this is true, then where does the money for the private school go, if not to teacher's salaries? I don't know the answer to this question, but I am struck by the class size difference possible if money is concentrated on teachers.

Maybe this could work more broadly as an alternative for some of the 11% of United States students that are enrolled in private schools.

(http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb09-ff14.html)

Alternative to Public and Charter Schools?

Taking it further, could something like this be used as an alternative to the public or charter school classrooms now in use? What could be achieved with this custom school mindset if we were limited to spending only what is spent on public or charter schools? Taking the average United States yearly cost of public school education just over \$10,000 per student,

(<http://www2.census.gov/govs/school/08f33pub.pdf>), and again use the \$32/hour pay rate for teachers, with 25 hours of instruction per student per week, and further assuming there is one administrator for every five teachers, then the average state expenditure of \$10,000 per year would support a class size of only four. (see appendix).

An easy way to explain this calculation, is if we expand the school year to 200 school days (which some have suggested is a better idea than the standard 180 days in any case), and each day had 5 hours of instruction per student, then that is 1,000 hours of instruction per year. With \$10,000 per student per year, that comes to \$10 per hour. With 4 students in a class, that becomes \$40 that can be spent-- \$32 for the teacher and \$8 towards the administrator. Even if there are other expenses, the goal of 4 students per class could be kept, possibly by reducing the instruction hours to private school standards, as 5 hours each day may be too much close attention for some students. A teacher working for \$32 per hour full time would earn approximately \$64,000 dollars a year, which is on par for the average public school teacher in the United States.

Therefore for what we are spending on public schools, we could support a class size of four in this system. It could be that a class size of four could change how instruction is done, who might want to teach, and most importantly, how much students could learn and achieve. This is an exciting prospect.

If each class were composed of a teacher and four students, and each class would work together for 5 hours each week, then each student would take 5 classes at any one time.

If the school day were spread over the 9 to 5 workday, then students would have three hours during the day they were not in class. Older students could use this time to get from one class to another thus freeing the constraint of having to have all the teachers and facilities in one building. This longer school day would correspond more closely with working parent schedules so could alleviate some of the after school program issues that have come up. Teachers could teach the full 8 hours in this model or could be part time. With smaller class sizes and 5 hours a week with a particular class, I am assuming that class time is not as exhausting so a full class schedule is practical.

With instruction happening in museums and libraries, in homes and in workplaces the students could be exposed to professionals doing their jobs instead of a school environment.

In talking with the Dean of Science and the Director of Education at the California Academy of Science about this idea they said were enthusiastic in having their scientists teach part time in such a school system.

If art history could be taught by curators at the DeYoung Art Museum, and science by scientists, and engineering by engineers, we might create an inspired student population but just as important, we could have an inspired set of professionals that would be interested in teaching. Ideally there would be a mix of traditional teachers that can share their experience as well as help students achieve good test scores on standardized tests and lessons to help them go back into traditional universities and schools if they want to.

How the structure of such a system might work is that for every 32 students, there are 5 full-time equivalent teachers and one full time administrator. (We do not need 5 teachers for every 20 students because each student is only in class 5 hours a day, where a teacher can teach 8 hours). If this idea catches on and there is a larger pool of students, teachers, and administrators, then this can make scheduling and coordination easier as there will be more possible combinations of times and subjects. In contrast to some public schools where there is one teacher for every 32 students, we would have 5 teachers in addition to a full time administrator for every 32 students.

Each student would pick their classes based on consultation with the parents, teachers, and administrators. If each class were taught for 5 hours each week, then each student would have 5 classes. I can imagine supporting information on websites to surface past student's feedback on classes as well as help in juggling schedules.

Parents could be as involved as they wanted to be. They could be part time or full time teachers, they could be administrators, and they can help guide their children to find the right classes to take. Or they can leverage the administrator for this help.

Especially with the wide range of student's different needs, the adaptability of a custom school system could help a great deal. For instance according to the US Census, 50% of California students have at least one parent that is foreign born which could lead to diverse student needs which might be easier to accommodate with a custom school than traditional schools.

http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb09-ff14.html

The role of teaching could also be majorly transformed by this system bringing many professionals into the role of teacher, possibly part time, in a way that could help students and themselves. Based on my experience, it is easier as a non-teacher to teach a smaller group than when I have tried to teach larger groups. If this experience is more broadly applicable, then we could interest professionals in integrating teaching into their lives in a way that brings students into close contact with a wider range of experiences than the current professional teacher system affords.

A custom school administrator that could work with 5 teachers and 32 children could aid in scheduling and training of teachers, working on group lessons, as well as administering the standardized tests that are becoming more ubiquitous in the United States. In general an administrator could help keep the teachers focused on teaching and the students focused on learning by filling the gaps where needed.

If our experience in avoiding Ritalin for our child by attending custom classes also works for other families, then that could be a boon as well. In a report by the Drug Enforcement Agency, they reported that prescriptions to these drugs is up 400-500% since 1990 leading to 7-10% of boys being prescribed the drugs at some point. (<http://www.add-adhd.org/ritalin.html>)

In some ways, this more custom school resembles the education of nobles and royalty, which was often done with tutors. Now we might have the opportunity to take this type of learning that was reserved for the very wealthy and make it more broadly available to all income levels.

Some wealthy parents are already starting to build these "custom schools" around their children, but I have not seen wide discussion of it yet. If the economics do, in fact, work for experimenting on a wider scale, then that may interest researchers to study this model to see what age and demographic of student and teachers might yield better education results and open up the bigger question of what we mean by "better education results" in the first place. If the results are promising, then it could deserve to be added to the mix of offered teaching methods.

Ideally, I want my children to learn art from artists, science from scientists, and English from writers. I would like to have teachers that instruct and inspire and not limit ourselves to just those that can manage large classrooms of children, and I

would like to prepare our children as well as adults to be integrated in the learning and teaching process in a ongoing and ubiquitous way. If we succeed, we could have a generation of adults that are on fire, ready to take on the challenges and joys of life with gusto.

Appendix 1:

<http://pacificpatch.com/articles/controlling-your-childs-class-size>

Appendix 2:

The spreadsheet of cost of education. Original spreadsheet in:
<http://www.archive.org/details/ClassSizeMattersArticle>

Class Size Matters

Class sizes have continued to grow over the past ten years. What has this trend done to the quality of education and what can you, as a parent, do about it?



[Class Notes](#)

By [Suzanne Scafuri](#)

When I was a little girl, I wanted to be locked in the [Smithsonian Museum](#).

I lived in Washington, DC at the time, and I didn't like going to museums when they were full of people, full of echoing children and heavy shoes. I could never get close enough to see the exhibits, and, because I was shy, I wasn't the type to shove my way to the front.

So, when being pulled by a classmate's hand through exhibit after exhibit, I fantasized about getting lost, finding a quiet space, and then exploring later alone. I would roam the halls, getting closer than was allowed to Abraham Lincoln's bed, crawl inside the animal exhibits, and fall asleep in the minerals room.

I felt more comfortable in quiet spaces. I learned the best that way: I was able to experience my environment at my own pace, reading at warp-speed. Numbers that I never thought would ever multiply would magically solve themselves, and my hardest subject, Science, became manageable with drawings, real-life examples, and help from my engineer grandfather.

Now that I'm an English teacher, I often reflect on who I am as a learner. And, with all of the press of government budget cuts, [No Child Left Behind](#), public vs. private education, censorships, and test scores and the opportunity to be an educational columnist, I am looking harder at who kids are as learners. What do they need? What is the best educational option to promote learning: public or private? Why should we expect that all students will perform the same in the same size classroom?

I have done what I consider to be three types of teaching: public school teaching in a classroom with 35 kids, 105 per day kids total, private school teaching in a classroom with 8-17 students per class, 30-72 kids per day total, and tutoring one student at a time.

Public school teaching is the most difficult for a variety of reasons. The limitations of curriculum, budget cuts, and huge class sizes made teaching at the public school like a hurdle race. With a class of 35 students and a 50-minute class time, a teacher can hope for about 15 full minutes of teaching. The rest of the time is answering questions, resolving discipline issues, and passing out papers. Not a lot of people believe this is true, but, trust me, it is.

35 students means that each student gets about 1.5 minutes of my time in class directly. What if we are working on practice sentences and a student has a question? By the time I get to Student A, Students B through F have questions, too. Some questions don't get answered. That's the hardest part of all.

Homework is another issue altogether. In giving homework, it is the teacher's responsibility to make it valid by looking it over and making corrections. Because most of the homework I assigned was essays, grading each exercise would take a minimum of 4 minutes each. That equals 420 minutes, or 7 hours of grading; that is if there is only one assignment.

Did all my students always get the most thoughtful, most detailed, and informative comment from me on every single paper? Most of the time, yes. But it took years of teaching experience behind me and some multi-tasking magic to make it happen.

I know that some Pacifica teachers feel the same way about their overcrowded classes. One high-school teacher said, "It is not humanly possible to do this job effectively when the student to teacher ratio is large. If I had 90 total students instead of 140, this would be more manageable. Calling the parents is time consuming, but also necessary, and it is easier to do when there are less students."

Due to expanding class sizes, in 1996, California mandated a decrease in class size by close to [1/3 in grades K-3. This plan was thought to cost the state over \\$1 billion per year.](#) [The Public Policy Institute of California](#) compiled data from [1997-2000](#) that showed that the decrease in class size caused some interesting and unexpected side-effects.

Because of the reduction, more schools and classrooms were needed to accommodate the overflow of students. A significant increase of inexperienced and new teachers caused a gap between the students who had an experienced teacher in English A while the other half were in English B with the inexperienced teacher. This

gap widened by the year 2000 to an [average 20% of students](#) (students of color had a higher gap percentage, while white students had a lower gap).

Student achievement did not increase either. In fact, it decreased. Because of the percentage of inexperienced teachers, student achievement decreased in standardized tests, [especially for students of color](#).

The results may have been different if the state would have given the entire \$1 billion per year to the project. But, as funding became tighter, schools reverted back to larger class sizes, [some even larger than before](#).

There is no solid research that proves that smaller class sizes make a difference in a student's education, but I've worked in private schools where class sizes have ranged from 8-17 students per class. In working with 8 students for 50 minutes, I would have about 40 minutes of full teaching time. With 17 students, I had about 35 minutes of teaching time. I could check on their work with better comments and one-on-one help and I could thoroughly answer questions. I had enough time for grading homework, communicating with parents, and planning lessons.

Were these students more successful with smaller class sizes? Probably, yes, and many people would like to have their children in private schools, but the tuition can be crippling.

In California, the average private school tuition is [\\$17,000](#) a year, a large amount for families struggling in the current economy.

Though many private schools offer a sliding scale tuition and scholarships, sometimes the costs can put too much stress on a household budget, even if the child would learn best within a smaller class.

Very effective teaching, in my opinion, is with one student. It makes sense: when tutoring, a student has my full attention, and questions from students and parents produce conversation and thorough explanations.

I'm currently tutoring one student named Logan. Because his experience in private school was not as positive as he and his parents had hoped, Logan's parents decided that they would take charge of Logan's education themselves, hiring tutors and finding a new way to educate their son.

Logan is a somewhat solitary student who is very interested in birds. Most of his friends are adults who also love birding, and Logan has traveled the world with his parents, living in communes, working with scientists, and learning about the world in a different way than a student would at a desk with a book.

When I told Logan I was writing this article, he was very animated about his views on class size. He told me that in a class of 17, he felt like he wasn't heard as much by his teachers, that there was pressure from other boys to not ask questions or act silly and he wasn't able to refocus his attention sometimes so he would think about birds, lost to the lesson at hand.

He likes his schedule now much more. I meet with him for 8 hours a week, covering English and History. He works with a Mandarin teacher 3 times a week, and for math, he studies Euclid with his father. For Science, he works at the [California Academy of Science](#), assisting researchers with categorization and cataloguing. He walks to our lessons, birding along the way.

He likes being able to have real working relationships with his teachers, where he can ask any question and get a detailed answer. His parents like it that they can email me and get an almost immediate response, with lots of details and thorough comments about even the smallest of assignments.

Though there are costs involved when choosing tutoring, it is likely to be less costly than most private school tuition.

Though this type of education works for Logan, it probably wouldn't work with everyone. He does not socialize much with kids his own age, and he doesn't have the opportunity to do group work—losing important team-building skills.

But, which education would you rather have for your children? One where there just isn't enough time to be completely heard, one where the class sizes are smaller but costs can be very high, or the tutoring option? Everyone learns best differently, and there is no perfect answer.

It's finding the right option for your children, the right size for the best learning, that matters most.

Economics of Schooling
Brewster 11/2010

	\$/hr	Hours/week	\$/week	notes
English/history	\$30.00	8.5	\$255	suzanne
Chinese	\$35.00	5	\$175	Ling
Math/brewster	\$30.00	3	\$90	Really free \$0
birdschool	7.5	6	\$45	\$45/week with expert in a group of 10
Exploratorium				
science	16.67	3	\$50	\$50/week \$0
piano	\$60.00	1	\$60	
fencing group	5.78	8	\$46	8hrs/week \$185/month
Fencing one-on-one	45	0.33	\$15	1 lesson/week \$150/10lessons 1/3 hr/lesson
tennis	\$50.00	0.75	\$38	3 per month \$50/hr; \$25 if pair \$37/week 3/4 hr/week \$0
Chinese cross check free	\$0.00	0.25	\$0	2hrs every 2 months for free from his old chinese teacher
SAT cross check	\$50.00	0.08	\$4	2Hrs every 6months for \$50/hr
total:	\$22	35.92	\$778	total hours per week, and \$ per week
Total academic	\$24	25.5	\$615	
Total arts/athletics	\$16	10.08	\$159	

Costs of school for Logan at Cathedral School for Boys in 2009 (San Francisco Private School)			
Cathedral school for boys:	\$35	22.5	\$778 \$28k/year full tuition, not including donations, 180 days/year
hours of instruction/day	4.5		8:30am-3pm, 1 hour for lunch, recess, gym? 45Minute cla

Comparison between Cathedral School for Boys and Custom School

hours of instruction cost	13.33% more instruction time than Cathedral
	-26.47% less money than Cathedral

Clover Custom School System Class size of 4: Charter school possibility?

4 class size	
8 Hours in workday per teacher	
5 hours of each student of each teacher per week	
5 number of days in a week	
5 number of hours of instruction per day for each student	
5 number of teachers instructing each student	
5 minimum number of teachers in clover school	
200 number of total instruction hours / week	
32 minimum number of kids in charter school	
5 number of separate "class rooms"	
\$32 \$/hr gross pay to teacher (includes benefits)	
\$10,000 State stipend per student each year	http://www.ed-data.k12.ca.us/Articles/article.asp?title=California+Charter+School+Stipend+for+Teachers
\$320,000 Total stipend for school	

200 School days in a year (official is 180)	
12 weeks off if the teacher teaches 200 days	
\$51,200 dollars per year per teacher teachers 200 days	
\$62,720 dollars per year per teacher if they work year-round with 3 weeks vacation	
\$256,000 cost of all teachers	

\$64,000 Income over the cost of teachers

This income could be used for 1 administrator / master teacher for each 5 teachers

Assumes no facilities or supplies costs, as would use existing space and materials